Economics of Saskatoon Berry Production

FarmFacts

Produced by Saskatchewan Agriculture and Food and Saskatchewan Rural Development

Background

Wild saskatoons *(Amelanchior alnifolia)* have been picked for hundreds of years on the prairies and people continue to harvest them today in spite of easily available and cheap fruits from outside the prairie region. Domestication and commercialization of saskatoons is really in its infancy, not only in Saskatchewan but throughout Canada and rest of the world. This makes it much more difficult to assess potential profitability than for crops such as blueberries which are already grown commercially in other parts of the world. However, there are several private and research station saskatoon orchards that have been in production for several decades. These are the source of information on expected yields, agronomic problems and the like. In addition, there are similarities between saskatoons and other commercialized small fruits that should give us some indication of economic potential.

Production and Production Feasibility

The acreage of commercial saskatoons has increased, especially in the Peace River area of Alberta (it is estimated that there are now between 100 - 200 acres of domesticated saskatoons on the Prairies in production and another 400 - 1000 acres planted but still too young to produce). Existing growers are expanding their saskatoon plantations — this would seem to indicate that at least some of the growers feel that it is a profitable enterprise.[1] Many of the most profitable stands appear to be near urban centres where a U-Pic system is used to harvest and market the berries and/or where irrigation and/or favorable environment conditions ensure a high yield almost every year.

Several high-yield varieties have already been licensed and further breeding of new varieties with improved taste is underway. In addition, researchers have developed several new techniques that considerably lower the cost of producing saskatoon seedling (eg. tissue culture, cold treated seed, use of mist beds). These developments are necessary precursors for reduction of the costs of saskatoon production.

A further development that should help reduce production costs is the importation of several mechanical harvesting machines. Many machines have been developed outside the Prairie region to mechanically harvest crops such as blackberries, highbush blueberries, raspberries, grapes and other small fruits. These have a similar, although not exactly the same, growth habit as saskatoons. With experience and some modification, it is possible to engineer a mechanical picker that will harvest saskatoons with a minimum of waste and damage, at one-quarter to one-third the cost of hand picking. Such machines would certainly help insure the long term viability of a saskatoon industry, significantly reducing the costs of production.

[1] Growers who have reduced or given up their saskatoon orchards stated poor weed control, poor soil or climatic conditions and poor health as the main reasons.

Economic Feasibility

Since the saskatoon industry is in its infancy, the long term viability of commercial saskatoon production and markets is yet to be determined. However, initial projections seem to indicate that saskatoons could be a profitable crop. To illustrate this, data were collected from a variety of publications and interviews to derive cost and yield data that could be reasonably be expected under Saskatchewan conditions. This data went into a spreadsheet format to generate 10 year pro forma cash flows, income statements and balance sheets that might be applicable for the development of a 10 acre saskatoon orchard.

Based on these projections, it appears that an irrigated saskatoon orchard might generate the following once it is fully developed:

Time Before Full Development	7 years
Mature Yield	3,200 lbs/acre
Development Costs	$6,900/acre
Net Cash Flow before interest, taxes & return to management	$2,400/acre
Internal Rate of Return to Equity (assuming initial equity equal to 50% of development costs)	20%

These results appeared to be particularly sensitive to yield, percent of the crops harvested by machine versus by hand harvest methods, wastage factor associated with machine picking and prices of U-Pic and machine picked berries. Thus, it appears that development of saskatoon orchards requires long term commitment and very high per acre investment costs. However, for the patient, returns can be more attractive than most other agricultural crops on the Prairies, particularly if the majority of the berries can be harvested on a U-Pic basis and/or if the area planted is sufficiently large to justify the purchase of a mechanical picker (i.e. over 30 acres) which does not miss many berries.

Processing Possibilities

Although Saskatoons are a very new commercial crop, several food processors are using wild and cultivated saskatoons in their food products. Probably the largest of these is a winery near Grande Prairie, Alberta, belonging to the Peace River Fruit Producers Co-operative. In addition, several small processors and/or growers make jams, jellies, preserves and pies. There seems to be considerable potential to expand this type of processing. The unique flavour and localized supplies are to the advantage of the processors, who use the saskatoon berry in gourmet products. In the short term, saskatoons command top price, relative to other berry products. This, in turn, makes it profitable for growers to process saskatoons on a very small scale and would certainly allow a considerable amount of "value-added" on the Prairies.

Marketing Prospects and Strategies

Industrial food processors and distributors have repeatedly stated they would use large quantities of saskatoons if they had an assured supply and reasonable prices (in the long term, with high production levels, this may mean a price similar, or somewhat higher, than blueberries). Such large users of berries form, no doubt, the largest volume market for saskatoons. Selling to such users generally results in large volumes but low, per unit profit margins. On the other hand, selling fresh and/or processed in the form of gourmet style products is generally a low volume, but high per unit profit outlet. Both types of markets need to be developed in the long run. A suitable strategy might be to encourage growers to sell a certain portion of their berries to processors who can then develop a long term commitment to product development and marketing. (This is, in fact, happening in the Peace River country where most growers are far from population centres — most of their production has been going to the cooperative winery and processing plant). However, growers who have the inclination and/or who are far from processing plants should conduct some small scale processing on their farm.

Saskatoon Berry Production Assumptions:

Technical Coefficients:

Total Land Area	11 acres
Total Area of Saskatoons	10 acres
Spacing Between Rows	19 ft.
Spacing Between Plants within Row	2.75 ft.
Plants Needed/Acre	880 plants/acre
Yield of Mature Stand	3,200 lbs/acre

Financial Coefficients

Cost of Planting Material	1.00 $/plant
Price of Saskatoons (U-Pic)	1.40 $/lb
Price of Saskatoons (machine picked)	1.00 $/lb
U-Pic Harvest Cost	0.05 $/lb
Pails, bags, etc.	0.05 $/lb
Machine Harvesting	0.20 $/lb
Machine Harvest Loss	30%
Percent Machine Harvested	40%
Interest Rate if Loan	13%
Interest Rate if Deposit	5%
Income Tax Rate	25%
Depreciation Rate — Tractor	30%
Depreciation Rate — Buildings & Equip.	20%
Depreciation Rate — Dugout	10%

Items to be Depreciated

Tractor	5,000 $
Sprayer, Cleaner, Implements	15,000 $
Irrigation Equipment	15,000 $
Buildings	2,000 $
Dugout	8,000 $

Fixed Costs

Property Taxes	5.00 $/acre
Land Rent	30.00 $/acre
Equipment & Irrigation Operating	50.00 $/acre
Management	0 $/acre
Plants (cuttings)	880 $/acre
% of Dead Plants in Year 2	10%
Labour Wages	6.00/hour

After Interest & Tax Results

PV of Share Capital (5%)	38,095
PV of Final Equity and Annual Dividends (5%)	129,060
Return to Equity (10 yr. total)	339%
IRR (including final equity)	20%

★ ★ ★ if set up as a Venture Capital Corporation ★ ★ ★

PV of Share Capital (5%)	26,667
PV of Final Equity & Annual Dividends (5%)	129,060
Return to Equity (10 yr. total)	484%
IRR (including final equity	25%

Labour Requirements	YR 1	YR 2	YR 3	YR 4	YR5	YR6	YR7	YR8	YR 9	YR 10
Pruning (person-days/acre)	0	0	1	1	1	1	5	1	1	5
Other (person-days/acre)	3	5	5	5	5	5	5	5	5	5
Fertilization ($/acre)	10	10	10	10	10	10	10	10	10	10
Insect Control ($/acre)	0	0	20	20	20	20	20	20	20	20
Disease Control ($/acre)	0	0	20	20	20	20	20	20	20	20
Weed Control ($/acre)	70	70	70	70	70	70	70	70	70	70

Pro Forma Harvest Pattern

YEAR	1	2	3	4	5	6	7	8	9	10
Potential Yield as % of Mature Yield	0%	0%	0%	10%	40%	70%	100%	100%	100%	100%
Potential Yield/Acre	0	0	0	320	1,280	2,240	3,200	3,200	3,200	3,200
Actual U-Pic Yield/Acre	0	0	0	192	768	1,344	1,920	1,920	1,920	1,920
Actual Machine Yield/Acre	0	0	0	90	358	627	896	896	896	896
Total Harvested Production (lbs)	0	0	0	2,816	11,264	19,712	28,160	28,160	28,160	28,160

Pro Forma Cash Flow

YEAR	1	2	3	4	5	6	7	8	9	10
CASH IN										
Sale of Saskatoons	0	0	0	3,584	14,336	25,088	35,840	35,840	35,840	35,840
CASH OUT										
Fixed Costs										
Tractor	5,000									
Sprayer, Cleaner, Implements	12,000			3,000						
Irrigation Equipment	15,000									
Buildings	2,000									
Dugout	8,000									
Taxes	55	55	55	55	55	55	55	55	55	55
Land Rent	330	330	330	330	330	330	330	330	330	330
Equipment & Other Overhead	500	500	500	500	500	500	500	500	500	500
Management	0	0	0	0	0	0	0	0	0	0
Plants (cuttings)	8,802	880								
Variable Costs										
Labour (pruning & others)	1,440	2,400	2,880	2,880	2,880	2,880	2,880	2,880	2,880	2,880
Fertilization	100	100	100	100	100	100	100	100	100	100
Insect Control	0	0	200	200	200	200	200	200	200	200
Disease Control	0	0	200	200	200	200	200	200	200	200
Weed Control	700	700	700	700	700	700	700	700	700	700
Harvesting	0	0	0	275	1,101	1,926	2,752	2,752	2,752	2,752
Pails, bags, etc.	0	0	0	141	563	986	1,408	1,408	1,408	1,408
TOTAL CASH OUT	53,927	4,965	4,965	8,381	6,629	7,877	11,045	9,125	9,125	11,045
NET CASH FROM PRODUCTION	(53,927)	(4,965)	(4,965)	(4,797)	(7,707)	17,211	24,795	26,715	26,715	24,795
BEGINNING CASH	0	(14,832)	(22,048)	(30,202)	(39,238)	(36,130)	(22,498)	1,792	28,373	50,454
Share Capital	40,000	0	0	0	0	0	0	0	0	0
NET CASH FROM PRODUCTION	(53,927)	(4,965)	(4,965)	(4,797)	7,707	17,211	24,795	26,715	26,715	24,795
Dividends	0	0	0	0	0	0	0	0	0	0
Interest	(905)	(2,251)	(3,189)	(4,238)	(4,600)	(3,578)	(505)	757	2,087	3,143
Tax	0	0	0	0	0	0	0	(892)	(6,721)	(6,594)
ENDING CASH	(14,832)	(22,048)	(30,202)	(39,238)	(36,130)	(22,498)	1,792	28,373	50,454	71,797

Pro Forma Income Statements

YEAR	1	2	3	4	5	6	7	8	9	10
CASH INCOME										
Sale of Saskatoons	0	0	0	3,584	14,336	35,840	35,840	35,840	35,840	35,840
Other Income	0	0	0	0	0	0	0	0	0	0
Interest Income	0	0	0	0	0	0	0	757	2,087	3,143
TOTAL CASH INCOME	0	0	0	3,584	14,336	25,840	35,840	36,597	37,927	38,983
CASH EXPENSES										
Taxes	55	55	55	55	55	55	55	55	55	55
Land Rent	330	330	330	330	330	330	330	330	330	330
Equipment & Other Overhead	500	500	500	500	500	500	500	500	500	500
Management	0	0	0	0	0	0	0	0	0	0
Plants (cuttings)	8,802	880	0	0	0	0	0	0	0	0
Labour (pruning & others)	1,440	2,400	2,880	2,880	2,880	2,880	4,880	2,880	2,880	4,880
Fertilization	100	100	100	100	100	100	100	100	100	100
Insect Control	0	0	200	200	200	200	200	200	200	200
Disease Control	0	0	200	200	200	200	200	200	200	200
Weed Control	700	700	700	700	700	700	700	700	700	700
Harvesting (by machine)	0	0	0	275	1,101	1,926	2,752	2,752	2,752	2,752
Pails, bags, etc.	0	0	0	141	563	986	1,408	1,408	1,408	1,408
Interest Expenses	905	2,251	3,189	4,238	4,600	3,578	505	0	0	0
TOTAL CASH EXPENSES	12,832	7,216	8,154	9,619	11,229	11,455	11,550	9,125	9,125	11,045
NET CASH INCOME	(12,832)	(7,216)	(8,154)	(6,035)	3,107	13,633	24,280	27,472	28,802	27,938
NON-CASH ADJUSTMENTS										
Depreciation - Tractor	0	1,500	1,050	735	515	360	252	176	124	86
Depreciation - Sprayer, Cleaner, etc.	0	2,400	1,920	(864)	1,709	1,367	1,094	875	700	560
Depreciation - Irrigation Equipment	0	3,000	2,400	1,920	1,536	1,229	983	786	629	503
Depreciation - Buildings	0	400	320	256	205	164	131	105	85	67
Deprecieation - Dugout	0	800	720	648	583	525	472	425	353	344
Other	0	0	0	0	0	0	0	0	0	0
NET INCOME	(12,832)	(15,316)	(14,564)	(8,730)	(1,440)	9,988	21,358	25,105	26,882	26,376
Cummulative Net Income	(12,832)	(28,148)	(42,712)	(51,443)	(52,883)	(42,895)	(21,537)	3,568	30,450	56,826)
Tax	0	0	0	0	0	0	0	(892)	(6,721)	(6,594)
AFTER TAX NET INCOME	(12,832)	(15,316)	(14,564)	(8,730)	(1,440)	9,988	21,358	24,213	30,162	19,782

Pro Forma Balance Sheets

YEAR	1	2	3	4	5	6	7	8	9	10
ASSETS										
Cash & Bank Balances	0	0	0	0	0	0	1,792	28,373	50,454	71,797
Tractor	5,000	3,500	2,450	1,715	1,201	840	588	412	288	202
Sprayer, Cleaner, Implements	12,000	9,600	7,680	8,544	6,835	5,468	4,375	3,500	2,800	2,240
Irrigation Equipment	15,000	12,000	9,600	7,680	6,144	4,915	3,932	3,146	2,517	2,013
Buildings	2,000	1,600	1,280	1,024	819	655	524	419	336	268
Dugout	8,000	7,200	6,480	5,832	5,249	4,724	4,252	3,826	3,444	3,099
Trees (Avg. Last 3 Yr. Net Income *)	0	0	0	0	0	0	0	0	0	130,606
TOTAL ASSETS	42,000	33,900	27,490	24,795	20,248	16,603	15,463	39,676	59,838	210,225
LIABILITIES										
Loans & Accrued Interest	14,832	22,048	30,202	39,238	36,130	22,498	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0
TOTAL LIABILITIES	14,832	22,048	30,202	39,238	36,130	22,498	0	0	0	0
EQUITY										
Share Capital	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000
Retained Earnings	(12,832)	(28,148)	(42,712)	(54,443)	(55,883)	(45,895)	(24,537)	(324)	19,838	170,225
TOTAL EQUITY	27,168	11,852	(2,712)	(14,443)	(15,883)	(5,895)	(15,463)	39,676	59,838	210,225
TOTAL LIABILITIES & EQUITY	42,000	33,900	27,490	24,795	20,248	16,603	15,463	39,676	59,838	210,225
CHECK: (Assets-Liabilities-Equity)	(0)	0	0	0	0	0	0	0	0	0
DIVIDENDS & FINAL EQUITY	0	0	0	0	0	0	0	0	0	210,225
INITIAL EQUITY & DIVIDENDS & FINAL EQUITY	(40,000)	0	0	0	0	0	0	0	0	210,225
★ if Venture Capital Corporation ★										
INITIAL EQUITY & DIVIDENDS & FINAL EQUITY	(28,000)	0	0	0	0	0	0	0	0	210,225